

Mechanical and Water Absorption Properties of Sisal-Fibre-Reinforced Polypropylene Composites for Ceiling Applications

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Abstract: This work investigated the effect of water on sisal-fibre-reinforced polypropylene composites used in ceiling applications. Sisal-fibre was extracted by soil retting after which specimens were chemically treated with 1 molar solution of KOH, NaCl, HCl and Ethanol, respectively. Both treated and untreated sisal-fibres were used for the reinforcement of homopolymer and copolymer polypropylene. The composites were produced by a compression moulding technique, after which mechanical tests such as: tensile, impact and hardness tests were carried out on the samples. This was followed by water absorption tests using rainwater and distilled water. A Scanning Electron Microscope (SEM) was used to study morphology of the fractured surface of the composites after the test. The results showed that chemical treatment for the modification of the fibre surface can be exploited to enhance the mechanical and water absorption properties of the composites. An optimum result was obtained in KOH treated sisal-fibre-reinforced homopolymer polypropylene composites.

Keywords: Mechanical properties, water absorption, sisal- fibre, chemical treatment